APPENDIX I

Temperature Monitoring Data and Evaluation of Relevant Criteria for MCR Steelhead CH Streams within the Donaldson Creek Allotment

Stream temperature is an important factor affecting distribution and abundance of salmonids within the Subbasin. Water temperatures influence water chemistry, as well as every phase of salmonid life history. Optimal temperatures for steelhead are 50˚ to 61˚ F (10˚ to 16˚ C), and the lethal temperature is approximately 77˚ F (25˚ C). Within the Subbasin, high stream temperatures occur near the end of July or the beginning of August and coincide with low stream flows and warm daytime temperatures. By the end of August, stream temperatures are typically dropping.

A variety of water temperature standards/desired conditions/criteria are addressed by the MNF when designing land management actions and evaluating their effects. They are described below.

Current Condition & Forest Plan Standards & Guidelines

The Forest Plan water temperature standard and RMO directs the Forest to meet state water quality standards and prevent measurable increases in water temperature (1990 Forest Plan Watershed S&G-2, 1995 PACFISH Water Temperature RMO), and maintain maximum water temperatures below 64°F within migration and rearing habitat and below 60°F within spawning habitats (PACFISH). The Forest Plan Watershed Standards and Guidelines are:

> **2. Water Quality Standards and BMP's.** Meet Water Quality Standards for waters of the States of Oregon (Oregon Administrative Rules, Chapter 340-41) and Idaho through planning, application, and monitoring of Best Management Practices (BMP's) in conformance with the Clean Water Act, regulations, and federal guidance issued there to.
>
> **7. Stream Temperatures.** Prevent measurable temperature increases in Class I Streams. Temperature increases on SMU Class II (and fish bearing Stream Management Unit Class III) streams will be limited to the criteria in State standards. Temperatures on other streams may be increased only to the extent that water quality goals on downstream, fish-bearing streams will still be met. Normally, stream shade management on Class III streams will differ little from treatment on Class II streams

Oregon State Water Quality Standards

In addition to meeting the Forest Plan standard, the Forest must meet Oregon water quality standards under the Clean Water Act. EPA approved new water quality standards for Oregon in March 2004. Streams in the aquatic effects analysis are considered "salmon and trout rearing and migration habitat" for Oregon water temperature standards. Therefore, the following water temperature standard applies:

The seven-day-average maximum temperature of streams identified as having salmon and trout rearing and migration use; may not exceed **17.8** degrees Celsius (**64.4** degrees Fahrenheit).

APPENDIX I

Amendment 29 DFC

1. Chinook and/or Westslope cutthroat trout spawning & rearing habitat - 7 Day Mean Max 55°F (12.8°C)
2. All other John Day Basin streams – 7 Day Mean Max 64°F (17.8°C) - *Amendment 29 specifies DFCs for temperature to result in compliance with Oregon State Water Quality Standards, including instantaneous reading at any time of less than 68°F (20°C) in all anadromous streams without Chinook, bull trout, or Westslope cutthroat trout spawning and rearing habitat. This water quality standard has been revised since Amendment 29 was issued, thus the revised standard is applied.*

PACFISH RMO

1. No measurable increase in 7 Day Mean Max – *MNF data insufficient to determine whether this RMO is being met.*
2. Migration & rearing habitat - 7 Day Mean Max Below 64°F (17.8°C)
3. Spawning habitat - 7 day Mean Max Below 60°F (15.6°C)

Matrix of Pathways and Indicators:

STEELHEAD (S)

1. Functioning Appropriately (FA): 7 Day Mean Max 50-57°F (10-13.9°C)
2. Functioning At Risk (FAR): 7 Day Mean Max - Spawning habitat 57-61°F (13.9-16.1°C), Migration & rearing habitat 57-64°F (13.9-17.8)
3. Functioning At Unacceptable Risk (FAUR): 7 Day Mean Max - Spawning habitat >61°F (16.1°C), Migration & rearing habitat >64°F (17.8°C)

Temperature Monitoring Data and Analysis

Table I-1 presents available water temperature monitoring data for streams in the Donaldson Allotment. Dates for monitoring at the sites vary from 1997 to 2000. The table also displays whether or not the temperature data meets or fails to meet each standard described above: 1) State water quality standards; 2) Amendment 29 DFC; 3) PACFISH RMO; and, 4) NMFS MPI. The locations of the Cottonwood Creek and Fox Creek temperature monitoring sites are displayed in Figure I-1. All sites failed to meet standards, and all but one site would be classified as "Functioning at Unacceptable Risk" using NMFS MPI criteria. Based on the data presented in the table, high summer stream temperatures appear to be prevalent within the allotment.

APPENDIX I

Table 1. Available Temperature Data and Relevant Criteria for Steelhead Critical Habitat Streams in the Donaldson Allotment									
Stream			***Years Analyzed***	***7 Day Mean Max Temp (°F)***			**Amendment 29 DFC** (Meet/Fail)	**PACFISH RMO** (Meet/Fail)	**MPI** (FA, FAR, FAUR)
Stream	**Elevation (feet)**	**Estimated Distance from Confluence with Larger Stream (or other landmark) (Miles/Section)**	**Years Analyzed**	**Mean of Yearly Max, of 7 Day Rolling Means, of Daily Max (°F)**	**Daily Max Over 64 °F (Mean Days Per Year)**	**303(d) Listed?/More Data Available?**			
FOX CREEK Fox Upper Gorge	4090	At FS upper Boundary /S13	1999, 2000*	75.2	60	N/YS	Fail	Fail	FAUR
COTTONWOOD CREEK - Fox Lower Gorge	3820	0.1 mi. above lower FS Boundary / S13	1997, 1999, 2000*	74.1	67	Y/YS	Fail	Fail	FAUR
Donaldson Creek (Donaldson Site)	3960	0.3 mi. below confluence with western fork/S21	**No data available that meet criteria**	n/a	n/a	N/YS			
NOTES						YS=data available in DEQ summary spreadsheet			

*Data collected in one, season-long period per year. (Earlier years with data collected in multiple periods excluded)

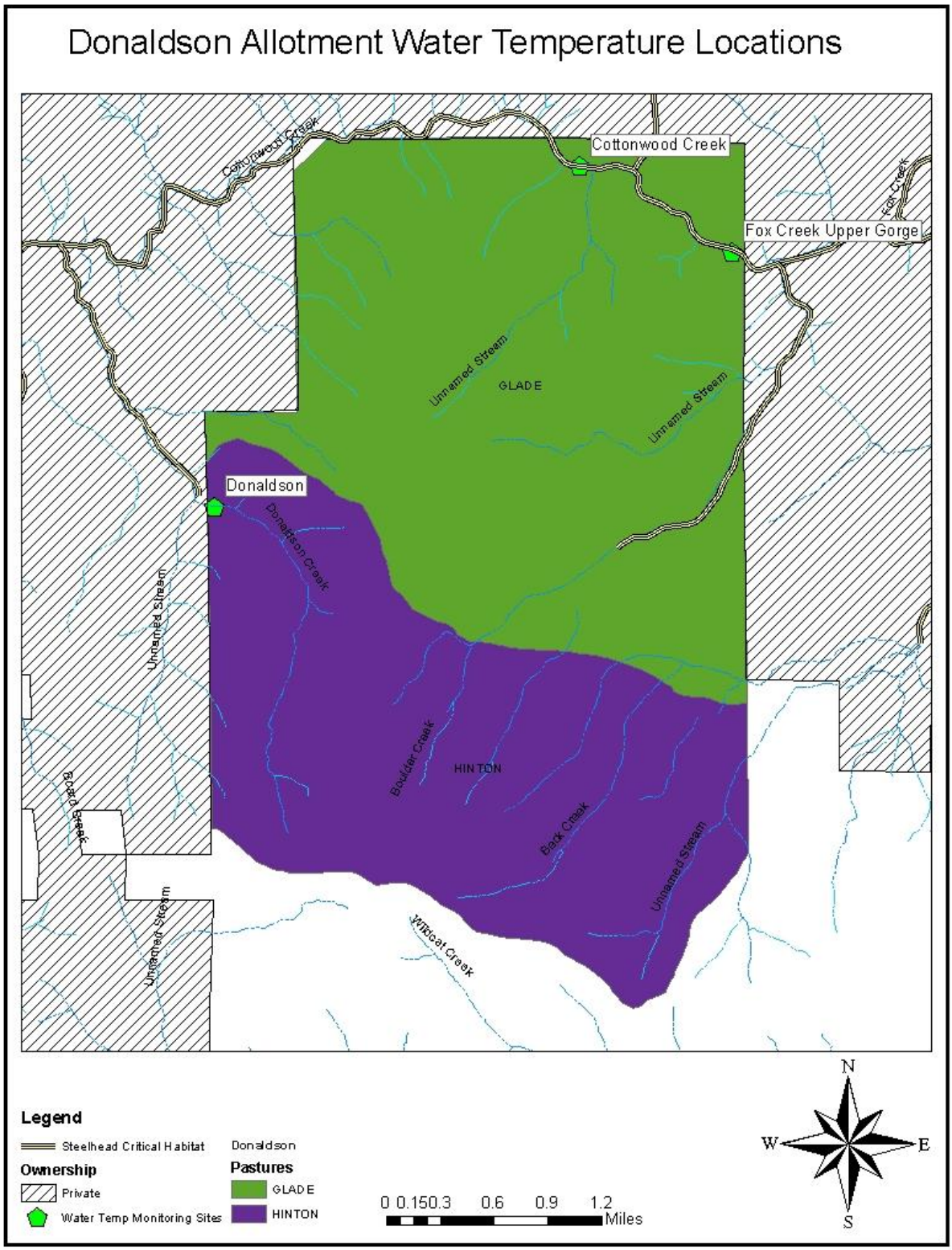

Figure 1 Stream Temperature Monitoring sites within the Donaldson Allotment

Temperature Monitoring Data and Evaluation of Relevant Criteria for MCR Steelhead CH Streams within the Deer Creek Allotment

Stream temperature is an important factor affecting distribution and abundance of salmonids within the Subbasin. Water temperatures influence water chemistry, as well as every phase of salmonid life history. Optimal temperatures for steelhead are 50˚ to 61˚ F (10˚ to 16˚ C), and the lethal temperature is approximately 77˚ F (25˚ C). Within the Subbasin, high stream temperatures occur near the end of July or the beginning of August and coincide with low stream flows and warm daytime temperatures. By the end of August, stream temperatures are typically dropping.

A variety of water temperature standards/desired conditions/criteria are addressed by the MNF when designing land management actions and evaluating their effects. They are described below.

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Oregon State Water Quality Standards

In addition to meeting the Forest Plan standard, the Forest must meet Oregon water quality standards under the Clean Water Act. EPA approved new water quality standards for Oregon in March 2004. Streams in the aquatic effects analysis are considered "salmon and trout rearing and migration habitat" for Oregon water temperature standards. Therefore, the following water temperature standard applies:

The seven-day-average maximum temperature of streams identified as having salmon and trout rearing and migration use; may not exceed **17.8** degrees Celsius (**64.4** degrees Fahrenheit).

Amendment 29 DFC

3. Chinook and/or Westslope cutthroat trout spawning & rearing habitat - 7 Day Mean Max 55°F (12.8°C)
4. All other John Day Basin streams – 7 Day Mean Max 64°F (17.8°C) - *Amendment 29 specifies DFCs for temperature to result in compliance with Oregon State Water Quality Standards, including instantaneous reading at any time of less than 68°F (20°C) in all anadromous streams without Chinook, bull trout, or Westslope cutthroat trout spawning and rearing habitat. This water quality standard has been revised since Amendment 29 was issued, thus the revised standard is applied.*

PACFISH RMO

4. No measurable increase in 7 Day Mean Max – *MNF data insufficient to determine whether this RMO is being met.*
5. Migration & rearing habitat - 7 Day Mean Max Below 64°F (17.8°C)
6. Spawning habitat - 7 day Mean Max Below 60°F (15.6°C)

Matrix of Pathways and Indicators:

STEELHEAD (S)

4. Functioning Appropriately (FA): 7 Day Mean Max 50-57°F (10-13.9°C)
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Temperature Monitoring Data and Analysis

Table I-1 presents available water temperature monitoring data for streams in the Deer Creek Allotment. Dates for monitoring at the sites vary from 1993 and 1995. The table also displays whether or not the temperature data meets or fails to meet each standard described above: 1) State water quality standards; 2) Amendment 29 DFC; 3) PACFISH RMO; and, 4) NMFS MPI. The locations of the West Fork Deer Creek temperature monitoring sites are displayed in Figure I-1. The site met standards would be classified as "Functioning Acceptably" using NMFS MPI criteria. Based on the data presented in the table, high summer stream temperatures appear to be within standards for the allotment.

APPENDIX I

Table 2 Available Temperature Data and Relevant Criteria for Steelhead Critical Habitat Streams in the Deer Creek Allotment									
Stream			***Years Analyzed***	***7 Day Mean Max Temp (°F)***					
Stream	**Elevation (feet)**	**Estimated Distance from Confluence with Larger Stream (or other landmark) (Miles/Section)**	**Years Analyzed**	**Mean of Yearly Max, of 7 Day Rolling Means, of Daily Max (°F)**	**Daily Max Over 64 °F (Mean Days Per Year)**	**303(d) Listed?/More Data Available?**	**Amendment 29 DFC** (Meet/Fail)	**PACFISH RMO** (Meet/Fail)	**MPI** (FA, FAR, FAUR)
WF Deer Creek	4050	At FS Boundary /S11	#	**NONE OF AVAILABLE DATA MEET CRITERIA – see below**	n/a	N/YS			
OTHER									
WF Deer Creek	same	Same	1993, 1995**	61.0	0	same	Meet	Meet	FA
NOTES			# Data from early, mid 1990s			YS=data available in DEQ summary spreadsheet			
VICINITY									
EF Deer Creek	3990	At FS Boundary / S7	#	**NONE OF AVAILABLE DATA MEET CRITERIA – see below**	n/a	N/YS			
EF Deer Creek trib	4350	0.1 mi. upstream of 4020 crossing near intersection with 165 road	#	**NONE OF AVAILABLE DATA MEET CRITERIA – see below**	n/a	N/YS			
OTHER									
EF Deer Creek	same	Same	1993**	67.7	9***	same	Fail	Fail	FAR
EF Deer Creek trib	same	same	1993**	partial season	--	same			

*Data collected in one, season-long period per year. (Earlier years with data collected in multiple periods excluded).** Data collected in two periods per year. Data were combined informally for this analysis. *** Probably underestimated by 5-6 days.

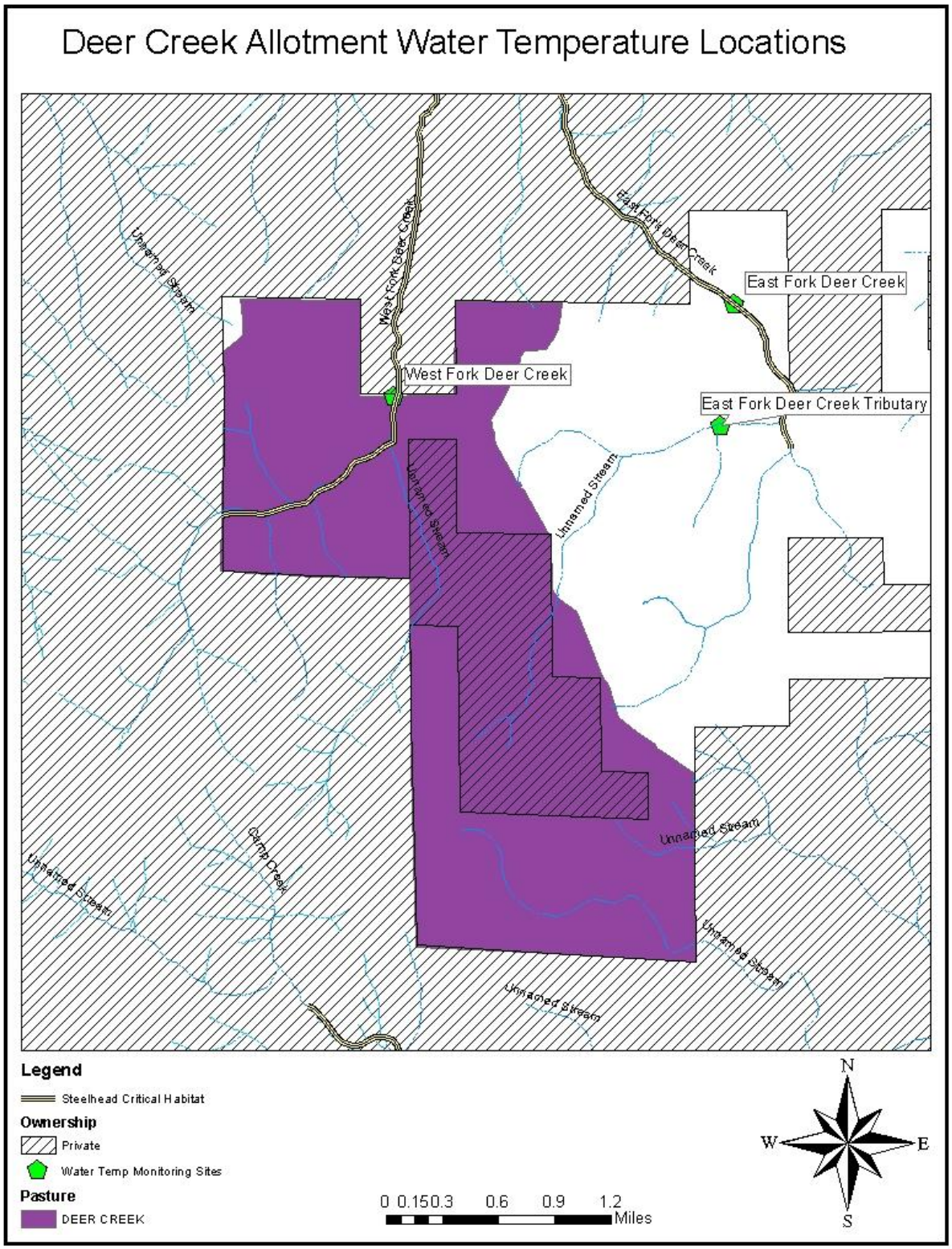

Figure 2 Stream temperature monitoring sites within the Deer Creek Allotment